What is claimed is:

1. A gas flow controller comprising:

a pressure-containing housing including a gas inlet, a gas outlet, an auxiliary chamber separated from the gas inlet by a partition wall and a valve arrangement adapted to be actuated to adjust flow from the gas inlet to the gas outlet in response to a differential pressure between the inlet and the auxiliary chamber; and

a servo pump in the housing and adapted to produce the differential pressure by pumping the gas from the auxiliary chamber to the gas inlet.

2. A gas flow controller according to claim 1, wherein the servo pump is disposed on the partition wall.

3. A gas flow controller according to claim 1, further comprising:

an overflow device that forms a permanent fluid connection between the auxiliary chamber and a channel at the inlet.

4. A gas flow controller according to claim 3, wherein the overflow device includes at least one of: an opening provided on the partition wall and a channel provided on the servo pump.

5. A gas flow controller according to claim 1, wherein the valve member is adapted to be actuated by a diaphragm adapted to actuate the valve member in response to the differential pressure between the gas inlet and the auxiliary chamber.

6. A gas flow controller according to claim 1, wherein the valve arrangement includes at least two functionally separated valves arranged serially with respect to the flow of the gas.

7. A gas flow controller according to claim 6, wherein the valve arrangement is disposed on the auxiliary chamber and the auxiliary chambers are in fluid connection via an opening.

8. A gas flow controller according to claim 1, wherein the valve arrangement closes the connection between the gas inlet and the gas outlet in response to the differential pressure being less than a predetermined value.

9. A gas flow controller according to claim 1, wherein the valve arrangement includes a valve member and a valve seat, the valve member configured and arranged to close the valve arrangement in response to pressure in the auxiliary chamber pressing the valve member onto the valve seat.

10. A gas flow controller according to claim 9, further comprising:

a prestressing means configured and arranged to apply pressure to the valve member for pressing the valve member onto the valve seat for closing the valve arrangement.

11. A gas flow controller according to claim 1, wherein the servo pump is an electrically operated pump.

12. A gas flow controller comprising:

a pressure housing having an inlet and an outlet and a channel therebetween;

an auxiliary chamber in the pressure housing;

a control pump configured and arranged to create a differential pressure between the auxiliary chamber and the inlet; and

a valve arrangement in the chamber and configured and arranged for controlling gas flow in the channel between the inlet and the outlet as a function of the differential pressure between the auxiliary chamber and the inlet.

13. The gas flow controller of claim 12, further comprising a diaphragm between the auxiliary chamber and the channel and adapted to apply moving force that tends to open the valve arrangement in response to a gas pressure in the channel being higher than gas pressure in the auxiliary chamber.

14. The gas flow controller of claim 13, wherein the control pump includes an electric servo pump.

15. The gas flow controller of claim 12, further comprising an overflow device adapted to flow gas between the auxiliary chamber and the inlet in response to a pressure differential between the auxiliary chamber and the inlet.

16. The gas flow controller of claim 12, wherein the valve arrangement includes a valve member and a valve seat, the valve arrangement being in a closed position when the valve member is pressed against the valve seat.

17. The gas flow controller of claim 16, further comprising a prestressing means configured and arranged to apply force to the valve member in a direction that tends to press the valve member against the valve seat.

18. The gas flow controller of claim 16, wherein the diaphragm is coupled to the valve member and is configured and arranged to apply force to the valve member in a direction that tends to move the valve member away from the valve seat in response to gas pressure at the inlet being higher than gas pressure in the auxiliary chamber.

19. The gas flow controller of claim 18, wherein the diaphragm is further configured and arranged to apply a force to the valve member in a direction that tends to press the valve member against the valve seat in response to gas pressure in the auxiliary chamber being higher than gas pressure at the inlet.

20. A gas flow controller comprising:

a pressure housing having a channel and an auxiliary chamber separated by a diaphragm, the channel having an inlet and an outlet;

an overflow device adapted to flow gas from the channel to the auxiliary chamber;

a pump configured and arranged for pumping gas between the auxiliary chamber and the channel at a rate greater than gas flowing via the overflow device for controlling a differential pressure between the channel and the auxiliary chamber;

a valve arrangement including a prestressing device coupled to a valve member in a gas passageway between the inlet and the outlet, the prestressing device being adapted to apply stress to the valve member in a direction that tends to press the valve member against a valve seat and close the gas passageway; and

the diaphragm being configured and arranged for applying stress to the valve member in a direction that tends to move the valve member away from the seat and open the gas passageway in response to the differential pressure between the channel and the auxiliary chamber applying pressure to the diaphragm sufficient to overcome the stress applied by the prestressing device.